

# FEATURE

*A monthly features service on scientific, technical, and educational subjects pertinent to development.*

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## TRANSFORMING INDIA'S THAR DESERT

by NARENDRA AGGARWAL

India's Rajasthan Canal Project, one of the largest canal systems in the world, is on its way to transforming a part of the world-famous Thar desert, lying desolate for centuries, into a land of plenty and prosperity.

Rajasthan State in western India, bordering with Pakistan, has an area of 34 million hectares (ha) of which 37 percent (13 million ha) is desert. Forests cover 1.5 million ha of the state, and 14.3 million ha are under rainfed crops. Only about 2.1 million ha are irrigated, 55 percent from dug wells, 35 percent from a public canal system and 10 percent from tanks or reservoirs. The mighty Rajasthan Canal will irrigate a further 2 million ha, enabling the production of an additional 3 million tonnes of food crops and 3.5 million tonnes of fodder for the state's precious cattle.

This area has no rivers, rainfall is poor, humidity is extremely low and sandstorms are an almost daily occurrence. There is almost no vegetation. The subsoil water table varies from 50 to 80 metres below ground and, in most areas when water is obtained it is brackish, unfit for irrigation and human consumption.

The search for water to transform the great Thar desert into lush fields and luxuriant orchards took concrete shape soon after India's independence in 1947. In 1951-53 the foundation of the Rajasthan Canal was laid with the construction of the Harike Headworks in the northern water-rich state of Punjab. The preparation of the estimates for the project was undertaken by the Central Water and Power Commission. After surveying the area in 1951, it recommended the construction of the Rajasthan Canal from the Harike Headworks up to Jaisalmer in Rajasthan.

At this stage, negotiations had also started with Pakistan for the utilization of the Indus river waters. Finally, in 1960, the Indus Water Treaty was signed under the aegis of the World Bank which entitled India to free use of the waters of the Ravi, Beas and Sutlej rivers. The Rajasthan Canal is a venture to utilize this water to provide irrigation to vast areas.

The Rajasthan Canal, with a full capacity of 523.8 cumecs (cubic metres per second) at head, will be 449 kilometres long when completed and have a 7000 km long distribution system to serve a cultivable area of 1.5 million ha. The intensity of irrigation of the project is 110 percent. The main canal and the distribution system are being lined with burnt clay tiles laid in cement mortar to minimize the water losses. The project is expected to cost Rs 4000 million (approximately US\$500 million).

Stage one of the canal, with a cultivable command area of over half a million hectares, is almost complete. It includes 204 km of feeder canals 40 metres wide, and 189 km of main canal with a distribution system spread over 3000 km. With the opening of more than half a million ha of land for irrigation, the Rajasthan Canal, once a dream, has become a reality. No other irrigation project in the country has opened such vast areas for food production, developed large areas of desert, created immense job possibilities and effectively arrested the march of the desert.

A Command Area Development Project for Stage one provides the necessary physical works and agriculture supporting services to enable a full realization of the benefits from irrigation. At present it covers 200,000 ha and includes lining 915 km of distributary canals, constructing 430 km of roads as well as water supply systems for 100 villages, developing pastures, and the afforestation of 35,000 ha of high shifting sand dunes adjacent to the irrigated areas.

Farm development work includes lining 58,000 km of water courses, land shaping 32,000 ha and the reclamation of 17,000 ha. The farmers will be helped to develop a further 26,000 ha, reclaim 17,000 ha and improve their on-farm irrigation channels. The total cost of these programs is Rs1390 (US\$173.8 million), and a World Bank credit of \$85 million has been secured.

Stage two of the project, which has already been started, will see the completion of the Rajasthan Main Canal from its 189th km to the end, and will include digging 4000 km of branches, distributary canals and minor canals to irrigate 0.76 million ha. Broad outlines are also presently being worked out for the development of the remaining 340,000 hectares.

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*Narendra Aggarwal is a staff correspondent and feature writer with the Hindustan Times of New Delhi, India.*



All means are used to dig the 449 km long Rajasthan Canal in India. Above, 700 camel carts move sand in the Thar Desert. Below, modern earth-moving machinery prepares the way for Stage two of the Canal which, when completed, will irrigate two million hectares of now unproductive land.

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